



PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE HONORABLE BOARD OF PATENT APPEALS AND INTERFERENCES

In re the Application of

Makoto KOBAYASHI et al.

Group Art Unit: 3723

Application No.: 09/830,434

Examiner: H. Shakeri

Filed: April 26, 2001

Docket No.: 109352

For: POLISHING PAD AND POLISHING METHOD FOR SEMI-CONDUCTOR WAFER

REPLY BRIEF

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Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

MAY 25 2004
TECHNOLOGY CENTER R3700

Sir:

In response to the Examiner's Answer mailed April 6, 2004, Appellants submit the following additional comments in response to specific points raised in the Examiner's Answer.

In the Examiner's Answer, the Examiner has maintained the rejection of all claims (claims 11-13, 17, 18, 20, 21 and 27-30) under 35 U.S.C. §103(a) based upon the teachings of the Admitted Prior Art in view of Cercone (U.S. Patent No. 6,004,402). In detailing the grounds for the rejection, the Examiner has incorrectly summarized the teachings of Cercone in several material respects.

First, Cercone is clearly directed to a cleaning sponge comprised of polyvinyl acetal, and one of ordinary skill in the art thus would not have turned to the teachings of Cercone with respect to looking to modify a polishing pad comprised of a non-woven fabric base layer

and a porous surface layer formed of foamed polyurethane. In the Examiner's Answer, the Examiner asserts that the teachings of Cercone are not limited to polyvinyl acetal sponge materials. The Examiner cites col. 7, lines 37-40 of Cercone and U.S. Patent No. 4,098,728, incorporated by reference in Cercone, as allegedly indicating that the teachings of Cercone can be applied to polyurethane sponge materials. Appellants strenuously disagree with the Examiner's characterization of the teachings of Cercone in this regard.

At col. 7, lines 37-42, Cercone recites:

"The disclosed extraction processes can be used to purify other sponge materials, such as that of the competitive product. However, the results may not be as good because the prior art has closed pores and fibrils as noted above."

This passage of Cercone thus merely references the "competitive product" having closed pores and fibrils described earlier in Cercone. This passage thus references col. 3, lines 10-18 of Cercone, describing "a typical conventional polyvinyl acetal sponge material" manufactured by Kanebo Corporation that has closed pores and fibrils therein. This "conventional sponge" is again referenced in col. 5, lines 24-27, which conventional sponge is then identified in Tables 1-6 as the "competitive sponge" product. From this, it is quite clear that the passage cited by the Examiner at col. 7 of Cercone merely indicates that the extraction processes described in Cercone cannot only be applied to the preferred open pore polyvinyl acetal sponge material, but can also be applied to the closed pore polyvinyl acetal sponge material of the conventional, competitive product. The Examiner's assertion that this passage somehow would have indicated to one of ordinary skill in the art that the extraction process could be applied to a very different polyurethane sponge material as alleged by the Examiner is not correct and is clearly based upon an improper hindsight reading of the teachings of Cercone.

The Examiner's reliance upon the teachings of U.S. Patent No. 4,098,728 as allegedly suggesting application of the teachings of Cercone to polyurethane sponge materials is also misplaced. First, the Examiner places significance on the fact that the disclosure of U.S. Patent No. 4,098,728 was incorporated into Cercone by reference. However, col. 1, lines 48-57 and col. 2, lines 57-64 of Cercone make clear that U.S. Patent No. 4,098,728 was incorporated by reference with respect to how to prepare a polyvinyl acetal sponge to have an open pure structure, the preferred embodiment in Cercone. There is no mention of polyurethane sponge materials in Cercone regarding the teachings of U.S. Patent No. 4,098,728.

Moreover, although U.S. Patent No. 4,098,728 does in fact indicate that polyurethane sponges are known for use as medical sponges, this patent contains nearly an entire column of problems known to be associated with polyurethane sponges. See col. 2, lines 9-63 of U.S. Patent No. 4,098,728. Accordingly, even if one of ordinary skill in the art were to have looked to the teachings of U.S. Patent No. 4,098,728 based upon the disclosure in Cercone, such practitioner clearly would have been led away from the use of polyurethane sponge materials. U.S. Patent No. 4,098,728 also teaches a preference for polyvinyl acetal sponge materials. Accordingly, Appellants respectfully submit that rather than supporting the Examiner's position, the teachings of U.S. Patent No. 4,098,728 confirm that one of ordinary skill in the art would not have been led to have applied the teachings of Cercone to polyurethane sponge materials as in the presently claimed invention.

The Examiner also argued that Cercone "discloses that in conventional sponges particulate residues such as zinc, and fibrils resulting from cross-linking reaction in forming the pores (curing or cross-linking procedures are common in the art in hardening and strengthening the resulting polymer such as polyurethane), are trapped in the closed or dead end pockets, and that these particulate matters can come out as material wears, which would

damage the surface of the work piece being treated." The Examiner here appears to indicate that the problem of fibril formation during cross-linking of polyvinyl acetal has applicability to all cross-linked materials, including polyurethane. However, at col. 1, lines 35-47, Cercone describes problems associated with conventional closed-pore polyvinyl acetal materials, which problems include the trapping of fibrils within the pores during cross-linking of the polyvinyl acetal. The presence of these fibrils hampers the ability of the polyvinyl acetal sponge to clean critical materials such as semiconductor wafers. See col. 1, lines 27-34. Accordingly, Cercone here describes problems particular to polyvinyl acetal materials that are intended to be used in a cleaning procedure, and nowhere does Cercone teach or suggest that such teachings have any applicability to different sponge materials such as polyurethane, particularly polyurethane to be used in a polishing operation and not a cleaning operation.

In other words, despite the Examiner's attempt to find the teachings of Cercone applicable to polyurethane materials based upon a mention of cross-linking to form a polyvinyl acetal material, clearly one of ordinary skill in the art would have found nothing in Cercone to have led such practitioner to have applied the teachings of Cercone to a polyurethane material. The attempt of the Examiner to link polyvinyl acetal to polyurethane based solely upon the mention of cross-linking is tenuous at best, and again is based upon an improper hindsight reading of the teachings of Cercone.

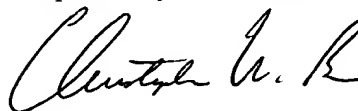
In summary, considering the teachings of Cercone as a whole, it is evident that one of ordinary skill in the art would find such teachings to be applicable to polyvinyl acetal cleaning sponges. Nothing in Cercone teaches or suggests that the teachings should or could be equally applied to a different polyurethane material used in a polishing procedure rather than in a cleaning procedure.

Finally, the Examiner again attempts to indicate that Cercone suggests the application of the sponges described therein for polishing procedures as well as cleaning procedures, citing col. 3, line 11 of Cercone. However, Cercone here merely indicates that a prior art polyvinyl acetal material was used in "cleaning and polishing rolls." This is the only mention of polishing anywhere in Cercone. Appellants again respectfully submit that this mention of polishing in Cercone does not indicate any teaching or suggestion to use the polyvinyl acetal cleaning sponge of Cercone in a polishing procedure. Cercone otherwise exclusively teaches that the polyvinyl acetal sponge made is to be used in cleaning, not polishing. See, for example, col. 1, lines 27-34, col. 2, lines 2-4 and col. 2, lines 31-33 of Cercone. One of ordinary skill in the art thus would not have found the teachings of Cercone relevant to polishing pads at all, and thus would not have looked to Cercone for any teachings with which to possibly modify the polishing pads of the Admitted Prior Art.

Again, Appellants respectfully submit that a proper reading of the entire teachings of Cercone clearly indicates that Cercone is directed to polyvinyl acetal cleaning sponges and methods of purifying the same. One of ordinary skill in the art would not have been led by the teachings of Cercone to have followed such teachings in attempting to modify a polyurethane polishing pad as in the presently claimed invention. The assertions of the Examiner attempting to link the teachings of Cercone to be applicable to a polyurethane polishing pad are clearly based upon improper hindsight in view of the presently claimed invention. Cercone teaches that in making a polyvinyl acetal sponge for cleaning, such a sponge should be subjected to a particular extraction process to substantially eliminate metals and fibrils from the cleaning sponge. However, as the Admitted Prior Art pad is not made of polyvinyl acetal and is not used for cleaning, one of ordinary skill in the art would not have been motivated to have applied the teachings of Cercone to the Admitted Prior Art pad for any reason or with any reasonable expectation of success.

For all the reasons stated in the Brief on Appeal, as well as the additional reasons set forth above, Appellants respectfully request this honorable Board to reverse the rejection of claims 11-13, 17, 18, 20, 21 and 27-30.

Respectfully submitted,



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